

having elastic properties, so that when the lid is pivoted between the open and closed position and/or twisted about the vertical axis, in conjunction with the conventional horizontal or vertical mechanical hinges of the device, the sheath will be permitted to likewise move or rotate. In order to prevent breakage and high losses, the properties of the sheath preferably limit the radius of bending or movement of the sheath so as to keep the optic fiber in a safe range and prevent breakage thereof or excessive losses.

[0039] Referring now to FIGS. 9 and 10, an alternate embodiment of the hinge system of the present invention is shown for use with a sliding-lid type cellular telephone. The hinge 88 generally comprises a flexible spring-like sheath 90 surrounding the optical fiber 18. In one embodiment, the spring-like sheath 90 is arcuately-shaped to accommodate the substantially transverse movement of the sheath 90 in the base 12. In operation, the spring-like sheath 90 moves as needed within a cavity (not shown) within the base 12 as the lid 14 is slide between an open and closed position.

[0040] In an additional embodiment (not shown), the optic fiber can pass through an internal passage between the base and the lid in the existing conventional hinge present in the device with or without an outer sheath or tubing. Likewise, the spring-like sheath can pass between the lid and base by following the outer contour of the conventional hinge provided in the device.

[0041] As shown in FIG. 11, it is appreciated that a plurality of paired light sources and detectors may be used with a plurality of optical fibers 18 extending between the lid 14 and the base 12 and not depart from the scope of the present invention. Furthermore, it is appreciated that a second sheath or tubing (not shown) may be used with the hinge system to carry power through electrical wires and/or serve as the negative or ground for the circuit.

[0042] Many modifications and variations of the present invention are possible in light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described. Various modifications, changes and variations may be made in the arrangement, operation and details of construction of the invention disclosed herein without departing from the spirit and scope of the invention. The present disclosure is intended to exemplify and not limit the invention.

1. A hinge system for a consumer electronics device having a base and a lid comprising:

- at least one optical fiber extending between the lid and the base, the at least one optical fiber having a first end and a second end;
- a light source operably located proximate the first end of the at least one optical fiber;
- a detector operably located proximate the second end of the at least one optical fiber; and
- a conduit for said optical fiber to pass from said base to the lid; and said conduit comprises a hinge enabling said lid to rotate relative to said base about a first axis of rotation.

2. The hinge system of claim 2 wherein said conduit further comprises a hinge enabling said lid to rotate relative to said base about a second axis substantially perpendicular to said first axis of rotation.

3. The hinge system of claim 1 wherein said conduit comprises rigid tubing having a hollow interior.

4. The hinge system of claim 1 wherein said conduit comprises a spring-like sheath having a hollow interior.

5. A hinged system for a consumer electronics device having a base and a lid, comprising:

a hinge connecting the base to the lid;

at least one optical fiber extending between the base and the lid, the at least one optical fiber having a first end and a second end;

a light source operably located proximate the first end of the at least one optical fiber;

a detector operably located proximate the second end of the at least one optical fiber; and

a protective and flexible spring-like sheath extending between the base and the lid for surrounding and protecting the at least one optical fiber.

6. The hinged system of claim 5 wherein the device is a flip-type phone.

7. The hinge system of claim 5 wherein the device is a flip-and-twist-type phone.

8. The hinge system of claim 5 wherein the lid slides relative to the base.

9. The hinge system of claim 8 wherein the flexible spring-like sheath is at least substantially arcuate in shape.

10. The hinge system of claim 9 wherein the base comprises a cavity and wherein the spring-like sheath travels within the cavity as the lid is slid relative to the base into an open or a closed position.

11. The hinge system of claim 5 wherein the spring-like sheath comprises a coiled strip of metal.

12. The hinge system of claim 5 wherein the spring-like sheath comprises a central section that extends substantially parallel to said hinge.

13. The hinge system of claim 5 wherein the hinge defines a horizontal flip axis for rotating the lid relative to the base between an open and a closed position, and the spring-like sheath comprises a central section that extends substantially along the horizontal flip axis to permit the lid to be rotated relative to the base.

14. The hinge system of claim 13 wherein the lid defines a vertical twist axis extending therethrough, and the spring like sheath further comprises an upper section that extends substantially along the vertical twist axis to permit the lid to be twisted relative to the base.

15. A hinge system for a device having a base and a lid, comprising:

a hinge rotatably connecting the base to the lid, wherein the hinge defines a horizontal flip axis for rotating the lid relative to the base between an open and a closed position;

at least one optical fiber extending between the base and the lid, wherein the at least one optical fiber has a first end and a second end;

at least one light source located proximate the first end of the at least one optical fiber;